Remarks

This communication is considered fully responsive to the Office Action. Claims 1-26 were examined. Claims 1-26 stand rejected. Claims 1, 6, 11, 15, 25, and 26 are amended. No claims are canceled. No new claims are currently added. Reexamination and reconsideration of the pending claims are respectfully requested.

Entry of Amendment After Final

Applicant respectfully requests entry of the amendment after Final because the amendment is merely clarifying of issues raised by the Examiner in the Final Office Action and/or corrects minor typographical errors without changing the scope of the claims or requiring additional search/consideration by the Examiner. It is noted that the amendment to claim 11 simply repeats recitations previously included in the preamble and already recognized by the Examiner. The amendment is believed to put the claims in condition for allowance or in better condition for appeal.

Claim Rejections - 35 U.S.C. 112

The Office Action rejected claims 1-10 and 25-26 under 35 U.S.C. 112, second paragraph, for reasons set forth in the Office Action. Applicant believes the amendment to claims 1 and 6 address the rejection with regard to independent claims 1 and 6 and corresponding dependent claims 2-5 and 7-10. Similarly, Applicant believes the amendment to claims 25 and 26 address these rejections. Applicant invites the Examiner to telephone the below-listed attorney if the Examiner desires alternate language.

Otherwise, Applicant respectfully requests withdrawal of the rejection of claims 1-10 and 25-26 on the basis of the current amendment.

Claim Rejections - 35 U.S.C. 101

The Office Action rejected claims 1-10 under 35 U.S.C. 101 as drawn to a computer program product defined in paragraph [0070] of the specification to encompass an electronic transmission signal. Claim 1 is amended to recite "A computer program product including computer-readable storage with a computer program, the computer program executing a computer process on a computer system, the computer process." A claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory. MPEP 2106.01. Applicant respectfully requests withdrawal of the rejection of claims 1-10 on this basis.

Claim Objections

The Office Action objected to claim 15 as improperly depending from itself. Applicant appreciates the Examiner noting this typographical error and claim 15 has been amended accordingly.

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Claim Rejections - 35 U.S.C. 103(a) – Hinton and Tawil

The Office Action rejected claims 1-2, 4, 6-7, 9, 11-14, 16-17, 20-21, 23-24, and 26 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 2003/0037187 to Hinton, et al. ("Hinton") in view of U.S. Patent No. 6,421,723 to Tawil ("Tawil"). Applicant respectfully traverses this rejection.

Claim 1 recites "for each host port connection, determining actual loading of IO jobs for each of the storage devices based at least in part on a queue depth for each of the host port LUNs" (emphasis added). The references fail to teach or suggest at least these recitations.

The Office Action cites to paragraphs [0026]-[0027] in Hinton as disclosing all but the queue depth in this recitation. However, Hinton describes a storage monitoring system that determines "useful data storage information (such as number and location of files, disk capacity, available disk space, and the like) and to then report the information to a requesting customer." Paragraph [0026]. That is, Hinton discloses determining information about the storage device itself, but there is no disclosure of determining actual loading of IO jobs. Nor would it be obvious to determine actual loading of IO jobs based on the disclosure of Hinton. The teachings of Hinton are directed to determining characteristics of the storage itself, and not to communications between the hosts and the storage system. See, e.g., Abstract in Hinton.

In addition, the Office Action relies on Tawil as disclosing the queue depth recited in claim 1. Applicant argues that Tawil is not properly combined with Hinton. In its decision, KSR Int'l Co. v. Teleflex, Inc., No 04-1350 (U.S. Apr. 30, 2007), the Supreme

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Court reaffirmed application of the Graham factors in making a determination of obviousness under 35 U.S.C. § 103(a). The four factual inquiries under Graham are: (1) determining the scope and contents of the prior art; (2) ascertaining the differences between the prior art and the claims in issue; (3) resolving the level of ordinary skill in the pertinent art; and (4) evaluating evidence of secondary consideration. Even if all of the prior art elements are disclosed by separate prior art references, the Examiner still must identify the reason why a person of ordinary skill in the art would have combined the prior art elements in the manner claimed.

The Office Action states that "one would have been motivated to use the queue depth to determine actual loading since the amount of work waiting on the host to [sic] connection to complete would be dependent upon the number of resources waiting for the host connection." However, Hinton discloses a storage monitoring system that determines "useful data storage information (such as number and location of files, disk capacity, available disk space, and the like) and to then report the information to a requesting customer." Paragraph [0026]. There is no disclosure in Hinton of determining actual loading of IO jobs, and therefore, there would be no need to use a queue or queue depth.

For at least the foregoing reasons claim 1 is believed to be allowable over the cited references and Applicant respectfully requests withdrawal of the rejection of claim 1.

Claims 2 and 4 depend from claim 1, which is believed to be allowable. Therefore, claims 2 and 4 are also believed to be allowable for at least the same reasons as claim 1.

In addition, claim 2 recites "determining actual loading for each of the storage devices based at least in part on a number of host groups in the storage network." The Office Action relies broadly on paragraph [0024] in Hinton as disclosing these recitations, however, Applicant cannot find any support for this rejection in paragraph [0024].

The Office Action states that "Applicant failed to provide any reason why the cited passages do not teach the claim limitations, and therefore are not persuasive" (see Office Action page 12). The burden is initially on the Patent Office to make a prima facie case in support of any rejection. This burden does not shift to the Applicant until and unless the Patent Office has met its burden. Here, Applicant asserts that the broad reference to paragraph [0024] failed to support the rejection as it is not specifically called out what in this paragraph is being relied on as determining actual loading for each of the storage devices based at least in part on a number of host groups in the storage network. Applicant also has reviewed paragraph [0024] and cannot understand what is being relied on as teaching or suggestion each of these claim recitations.

Claim 4 recites "uses a loading factor to determine if the actual loading for each of the storage devices exceeds a maximum loading." Again, Hinton is not concerned with loading as discussed above for claim 1, and therefore Hinton also fails to disclose the further recitations of claim 4. The Office Action also relies on Tawil at col. 2, lines 33-64 and col. 6, lines 13-24 as teaching these recitations. At col. 2, Tawil discloses a queue depth for a target set at a value equal to the total number of commands the target can accept divided by the total number of initiators, and notes that "the target should avoid a

task full status" (col. 2, line 64). However, Tawil does not teach using a loading factor to determine if the actual loading for each of the storage devices exceeds a maximum loading. At col. 6, Tawil discloses an adjustable queue depth "thus allowing compensation for the greater bandwidth demands of initiator 14" (col. 6, lines 23-24). Here Tawil teaches against the claim recitations because there is no maximum loading – the queue depth can be adjusted to compensate for any loading.

Withdrawal of the rejection of claims 2 and 4 is respectfully requested.

Claim 6 is rejected for the same reasons as claim 1 and therefore is believed to be allowable for at least the same reasons as claim 1. For at least the foregoing reasons claim 6 is believed to be allowable over the cited references and Applicant respectfully requests withdrawal of the rejection of claim 6.

Claims 7 and 9 depend from claim 6, which is believed to be allowable. Therefore, claims 7 and 9 are also believed to be allowable for at least the same reasons as claim 6. Claims 7 and 9 are also believed to be allowable for the additional reasons set forth above for claims 2 and 4, respectively. Withdrawal of the rejection of claims 7 and 9 is respectfully requested.

Claim 11 is rejected for the same reasons as claim 1 and therefore is believed to be allowable for at least the same reasons as claim 1. In addition, claim 11 recites "A method providing an input/output (IO) flow control mechanism in a storage network." The Office Action states that Hinton teaches this recitation (see the Office Action on page 6), but did not provide support in the detailed rejection. Therefore, the rejection is believed to be incomplete. The Office Action went on to dismiss these recitations as

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being part of the preamble in the Response to Arguments section (see the Office Action on page 12). The amendment places these recitations in the body of the claim. Applicant cannot find any teaching or suggestion of these recitations in the combination of references cited against claim 11.

For at least the foregoing reasons claim 11 is believed to be allowable over the cited references and Applicant respectfully requests withdrawal of the rejection of claim 11.

Claims 12-14, and 16-17 depend from claim 11, which is believed to be allowable. Therefore, claims 12-14, and 16-17 are also believed to be allowable for at least the same reasons as claim 11.

In addition, claims 12-14 and 16-17 include further recitations for "automatically determining actual loading for the storage device". The Office Action rejected these recitations based on paragraph [0023] and [0024] in Hinton. These paragraphs are a discussion of a storage area network. In paragraph [0024], Hinton states "The system 100 is useful for determining the operating parameters or characteristics of the storage 144 and for reporting this information in a useful form to the hosts 102, 112, 122 or operators of such devices." However, this broad statement of operating parameters does not contemplate the specific claim recitations of "automatically determining actual loading for the storage device." Again, Hinton is not concerned with loading as discussed above for claim 1, and therefore Hinton also fails to disclose the further recitations of claims 12-14 and 16-17. Withdrawal of the rejection of claims 12-14, and 16-17 is respectfully requested.

Claim 20 is rejected for the same reasons as claim 1 and therefore is believed to be allowable for at least the same reasons as claim 1. Claim 20 also recites "determining actual loading of the at least one storage device based at least in part on a queue depth of each host port connection so that the number of input/output (IO) jobs being issued by a host do not exceed the queue depth of a service queue." The Office Action relies on the abstract at lines 19-21, and col. 2, lines 32-64. In the Abstract, Tawil states "Adjusted queue depths may be set on a target-by-target basis to compensate for varying intiator bandwidth demands." Here, Tawil teaches precisely the opposite of Applicant's claim recitations. That is, Tawil teaches that the queue depths are adjusted based on bandwidth demands, whereas claim 20 recites determining actual loading based queue depth so as not to exceed the queue depth. If the queue depth is adjustable, the queue depth will not be exceeded. At col. 2, lines 32-64, Tawil discusses additional details for adjusting queue depth. However, this still does not disclose determining actual loading of the at least one storage device based at least in part on a queue depth of each host port connection so that the number of input/output (IO) jobs being issued by a host do not exceed the queue depth of a service queue. Therefore, the combination of references does not teach or suggest at least these recitations.

For at least the foregoing reasons claim 20 is believed to be allowable over the cited references and Applicant respectfully requests withdrawal of the rejection of claim 20.

Claims 21 and 23-24 depend from claim 20, which is believed to be allowable. Therefore, claims 21 and 23-24 are also believed to be allowable for at least the same

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reasons as claim 20. Withdrawal of the rejection of claims 21 and 23-24 is respectfully requested.

In addition, claim 21 is rejected for the same reasons as claim 2, and claims 23-24 are rejected for the same reasons as claims 16-17. Therefore, claims 21, and 23-24 are also believed to be allowable for the further reasons discussed above for claims 2 and 16-17, respectively. Withdrawal of the rejection of claims 21 and 23-24 is respectfully requested.

Claim 26 recites "wherein device loading is based at least in part on queue depth for each target port, number of host paths connected to the target port, and queue depth for each host port." The Office Action relies on Tawil at col. 5, lines 11-63. The Office Action failed to identify what in these three paragraphs is being relied on as reading on each of these recitations. For example, Applicant cannot find any mention here of a queue depth <u>for each host port</u>.

Claim Rejections - 35 U.S.C. 103(a) – Hinton, Tawil and Nahum

The Office Action rejected claims 3, 5, 8, 10, 15, 18-19, 22, and 25 under 35 U.S.C. 103(a) as being unpatentable over Hinton and Tawil and further in view of U.S. Patent No. 2004/0078599 to Nahum ("Nahum"). Applicant respectfully traverses this rejection.

Claims 3 and 5 depend from claim 1, claims 8 and 10 depend from claim 6, claims 15 and 18-19 depend from claim 11, and claim 22 depends from claim 20. Each of the independent claims is believed to be allowable. Therefore, each of these dependent

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claims is also believed to be allowable for at least the same reasons as the respective independent claims.

In addition, claim 3 recites "determining actual loading for each of the storage devices based at least in part on a number of LUN security groups in the storage network." The Office Action admits that Hinton and Tawil do not disclose these recitations. Applicant agrees with this admission. However, the Office Action relies on paragraph [0018] in Nahum as disclosing these recitations. Applicant disagrees. Paragraph [0018] describes a security procedure for authenticating each host. Nahum does not determine actual loading for each of the storage devices based at least in part on a number of LUN security groups in the storage network. Claims 8, 15, and 22 include similar recitations as claim 3.

Claim 5 recites "the computer process further simplifies host groups and LUN security groups into virtual connections for analysis." Again the Office Action cites broadly to paragraph [0018] in Nahum as disclosing these recitations. However, Applicant cannot find any basis for the rejection in paragraph [0018]. Claim 10 includes similar recitations as claim 5.

Claim 18 recites "wherein the maximum loading for the storage device is based on a loading factor" and claim 19 recites "the loading factor is in the range of about 80% to 90% of the service queue depth for the storage device." The Office Action relies broadly on paragraph [0085] in Nahum as disclosing these recitations. However, Applicant cannot find any basis for the rejection in paragraph [0085].

Also with regard to claims 5 and 18, the Office Action states that "Applicant failed to provide any reason why the cited passages do not teach the claim limitations, and therefore are not persuasive" (see Office Action page 12). The burden is initially on the Patent Office to make a prima facie case in support of any rejection. This burden does not shift to the Applicant until and unless the Patent Office has met its burden. Here, Applicant asserts that the broad reference to paragraphs [0018] and [0084] failed to support the rejection as it is not specifically called out what in paragraph [0018] is being relied on as "the computer process further simplifies host groups and LUN security groups into virtual connections for analysis" in claim 5, and what in paragraph [0084] is being relied on as "the maximum loading for the storage device is based on a loading factor" in claim 18. Applicant also has reviewed paragraphs [0018] and [0084] and cannot understand what is being relied on as teaching or suggestion each of these claim recitations.

Claim 25 was rejected on the same basis as claims 3 and 26. Therefore, claim 25 is also believed to be allowable for at least the same reasons already discussed above for these claims.

Withdrawal of the rejection of claims 3, 5, 8, 10, 15, 18-19, 22, and 25 is respectfully requested.

Conclusion

The Applicant respectfully requests that a timely Notice of Allowance be issued in this matter.

Respectfully Submitted,

/Mark D. Trenner/

Dated: ___July 15, 2008___   By: _____

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